

is factory pre-adjusted and should not be disassembled.

5. Remove the secondary piston assembly (Fig. 33). **Do not remove the outlet tube seats from the master cylinder body.**
6. Clean all parts in clean isopropyl alcohol, and inspect the parts for chipping, excessive wear or damage. **When using a master cylinder repair kit, install all the parts supplied.**
7. Be sure that all recesses, openings and internal passages are open and clean. Place all parts on a clean pan or paper.
8. Inspect the master cylinder bore for signs of etching, pitting, scoring or rust. If necessary to hone the master cylinder bore to repair damage, do not exceed allowable hone specifications.

Assembly

1. Dip all parts except the master cylinder body in clean brake fluid (ESA-M6C25-A) Ford Part No. C6AZ-19542-A or DOT-3 equivalent.
2. Carefully insert the complete secondary piston and return spring assembly in the master cylinder bore (Fig. 33).

3. Install the primary piston assembly in the master cylinder bore.
4. Depress the primary piston and install the snap ring in the cylinder bore groove.
5. Install the push rod, boot and retainer on the push rod, if so equipped. Install the push rod assembly into the primary piston. **Make sure the retainer is properly seated and holding the push rod securely.**
6. Position the inner end of the push rod boot (if so equipped) in the master cylinder body retaining groove.
7. Install the secondary piston stop bolt, if used, with an O-ring if screw is on bottom outside of master cylinder casting.
8. Install the bleed screw (if so equipped). Install the gasket (diaphragm) in the master cylinder filler cover. Position the gasket as shown in Fig. 33. **Make sure the gasket is securely seated.**
9. Install the cover and gasket on the master cylinder and secure the cover into position with the retainer.

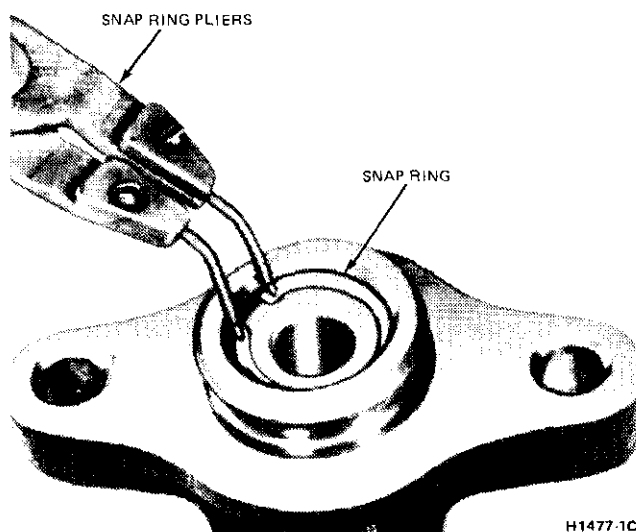


FIG. 34 Removing Snap Ring—Typical

CLEANING AND INSPECTION

DISC BRAKES

1. Remove the wheel and tire from the hub and rotor.
2. Inspect brake shoes and lining for wear. If the lining is worn to within 1/8 inch of the shoe, replace all (4) shoe and lining assemblies (complete axle set) on front or rear wheels as appropriate. On Fairmont/Zephyr, the rubber caliper insulators and

the plastic sleeves must be replaced when linings are replaced.

3. Visually check the caliper. If the caliper housing is leaking, it should be replaced. If a seal is leaking, the caliper must be disassembled and new seals

installed. If a piston is seized in the bore, a new caliper housing is required.

Refer to Part 12-20 for disc brake rotor resurfacing procedure.

DISC BRAKE SERVICE PRECAUTIONS

1. Grease or any other foreign material must be kept off the linings surfaces of the rotor, and external surfaces of the hub during service operations. In handling the rotor and caliper assemblies, avoid deformation of the brake rotor and nicking or scratching of brake linings.
2. If a caliper piston is removed for any reason, the piston seal must be replaced.
3. During removal and installation of a wheel assembly, exercise care not to interfere with and damage the caliper splash shield or the bleeder screw fitting.
4. Front wheel bearing end play is critical and must be within specifications.
5. Be sure the vehicle is centered on the hoist before servicing any front end components, to avoid bending or damaging the rotor splash shield on full right or left wheel turns.
6. Riding of the brake pedal (common on left-foot applications) must be avoided during vehicle operation.
7. The wheel and tire must be removed separately from the brake rotor, unlike drum brakes where the wheel, tire and drum can be removed as a unit.
8. Do not attempt to clean or restore oil or grease-soaked brake linings. When contaminated linings are found, brake linings must be replaced in complete axle sets.
9. On Fairmont/Zephyr only, always replace rubber caliper insulators and plastic sleeves when replacing linings. **Do not lubricate the slide pins.**

DRUM BRAKES

1. Remove the wheel from the drum, and remove the drum as outlined in Part 12-02.
2. Use an industrial vacuum cleaner to remove all dust from the backing plates and interior of the brake drums.
3. Inspect the brake shoes for excessive lining wear or shoe damage. If the lining is worn within 1/32 inch of the rivet heads or if the shoes are damaged, they must be replaced. Replace any lining that has been contaminated with oil, grease or brake fluid. Replace lining in axle sets. Prior to replacement of lining, the drum diameter should be checked to determine that the brake drum braking surface diameter is within specification. If the braking surface diameter exceeds specification, the drum must be replaced.
4. Check the condition of brake shoes, retracting springs, hold-down springs, and drum for signs of overheating. If the shoes have a slight blue coloring, indicating overheating, the retracting and hold-down springs should be replaced. **Overheated springs lose their pull and could cause the new lining to wear prematurely, if**

not replaced. If the brake drums are heat spotted, indicating an overheated condition, they should be replaced.

5. Inspect all other brake parts and replace any that are worn or damaged.
6. Inspect the brake drum and, if necessary, refinish. **The maximum inside braking surface diameter is shown on each brake drum (Fig. 33).** If the maximum inside braking surface diameter shown on the drum is exceeded either by wear or refinishing, the drum must be replaced. Refer to Part 12-02 for refinishing.

BRAKE BOOSTER

Check the booster operation as noted under Power Brake Functional Test. If the brake booster is damaged or inoperative, replace it with a new booster. **The brake booster is serviced only as an assembly, including the check valve.**

BRAKE TUBING

If a section of the brake tubing becomes damaged, the entire section should be replaced with tubing of the same type, size, shape and length. **Copper tubing should not be used in a hydraulic system.** When bending brake tubing to fit underbody or rear axle contours, be careful not to kink or crack the tube.

HYDRAULIC LINES

Double wall steel tubing is used throughout the brake system with the exception of the flexible hoses at the front wheels and at the rear axle housing brake tube connection.

Always bleed the applicable primary or secondary brake system after primary or secondary brake system hose or line replacement. Centralize the pressure differential valve after bleeding the system.

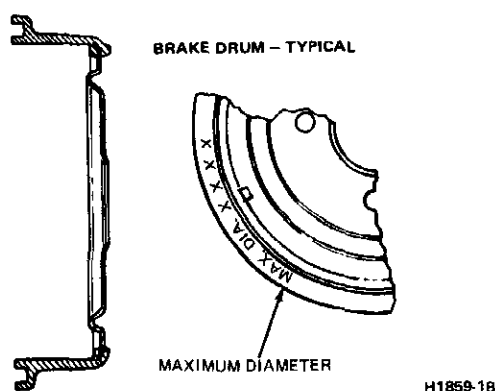
All brake tubing should be double flared properly to provide good leakproof connections. Clean the brake tubing by flushing with clean brake fluid before installation.

When connecting a tube to a hose, tube connector, or brake cylinder, tighten the tube fitting nut to specified torque with Milbar Tool 1112-144 or equivalent.

BRAKE HOSE

A flexible brake hose should be replaced if it shows signs of softening, cracking, or other damage.

When installing a new front brake hose, position the hose to avoid contact with other chassis parts. On all vehicles except Fairmont/Zephyr, place a new copper gasket over the hose fitting and thread the hose assembly into the front wheel cylinder or caliper. Fairmont/Zephyr front hose does not require a copper gasket and is reusable. Engage the opposite end of the hose to the bracket on the frame. The white stripe on the hose should show no evidence of twisting. Install the horseshoe-type retaining clip, and connect the tube to the hose with the tube fitting nut.



A rear brake hose should be installed so that it does not touch adjacent chassis parts or body. The white stripe on the hose should show no evidence of twisting. On rear drum brake vehicles, position the hose junction block on the axle and attach with a bolt and lockwasher. Connect the rear brake tubes to the junction block. On rear disc brake vehicles, attach the hoses to the calipers. Engage the front end of the hose to the bracket on the frame. Install the horseshoe-type retaining clip, and connect the tube to the hose with the tube fitting nut.

FIG. 35 Location of Brake Drum Maximum Inside Braking Surface Markings

SPECIAL SERVICE TOOLS

Tool No.	Description	Tool No.	Description
Rotunda 21-0001	Brake Pedal Effort Gauge	T71P-1102-A	Ball and Bar Gauge
Rotunda 21-0014	Vacuum Tester	Rotunda 10-0010	Brake Drum Micrometer
Rotunda 10-0011	Diaphragm Type Bleeder	Rotunda 54-0021	Disc Brake Lathe
Tool-4201-C	Universal Dial Indicator and Bracket	Milbar 1112-144	Inch Pound Torque Wrench

CH1860-2C

SPECIFICATIONS

BRAKE HYDRAULIC SYSTEM TORQUE LIMITS – FT. LBS.

	Fairmont, Zephyr	Ford-Mercury	LTD II, Thunder- bird, Cougar, Granada, Monarch, Versailles	Mustang II Pinto-Bobcat	Continental Mark V	Lincoln Continental
Master Cylinder to Dash Panel Screw	13-25	13-25	13-25	13-25		
Master Cylinder to Booster	13-25	13-25	13-25	13-25	13-25	13-25
Booster to Dash Panel	13-25	13-25	13-25	13-25	13-25	13-25
Pressure Differential Valve Bracket Bolts and Nuts	7-11	7-11	7-11	7-11	7-11	7-11
Wheel Cylinder Bleeder Screw	7.5-15 ②	7.5-15	7.5-15	110-160 in-lb	7.5-15	7.5-15
Caliper Bleeder Screw	6-15	6-15	6-15	6-15	6-15	6-15
Brake Hose Connection to Caliper		20-30	20-30	20-30	20-30	20-30
Brake Line Connection to Rear Axle Housing:						
Removable Carrier	—	30-40	25-35	12-19	30-40	30-40
Integral Type	12-19	25-33	12-19	12-19		
Hydraulic Tube Connections ①						
3/8 x 24	10-18	10-18	10-18	10-18	10-18	10-18
7/16 x 24	10-18	10-18	10-18	10-18	10-18	10-18
1/2 x 20	10-18	10-18	10-18	10-18	10-18	10-18
9/16 x 18	10-18	10-18	10-18	10-18	10-18	10-18
Brake Pedal Pivot Shaft Nut	15-25	15-25	15-25	15-25	15-25	15-25

① All hydraulic lines must be tightened to the specific torque value and be free of fluid leakage.

② Sedans — 32-65 in-lb.

CH2289-2D

BRAKE BOOSTER APPLICATIONS

Booster Type and Size	Car Line(s)	Comments
Vacuum – 7.5" Diameter Tandem Diaphragm	Pinto/Bobcat	R.P.O.
	Mustang II	Standard for all 5.0L (302 CID) and 2.8L Engines. Standard for 2.3L Engines with any of the following: P/S, A/C, Sun Roof or Locking Axle.
Vacuum – 9.0" Diameter Single Diaphragm	Granada/Monarch/Versailles	Standard for 5.0L/5.8L (302/351M CID) Engines. R.P.O. for 4.1L (250 CID)
Vacuum – 9.0" Diameter	Ford/Mercury Sedan, Police Sedan, LTD II, Cougar, Sta. Wagons	Standard
Vacuum – 11½" Diameter Single Diaphragm	Thunderbird	Standard
	Ranchero, LTD II, Cougar	Standard on Sedans
Hydro-Boost	Lincoln Continental	Standard
	Continental Mark V	Standard
	Ford/Mercury Sedan Granada/Monarch	R.P.O. – Required with rear disc brakes.
	Ford/Mercury Sta. Wagon	Standard
Vacuum – 220mm (9" equiv.) Single Diaphragm	Fairmont/Zephyr	Std. on 5.0 Litre (302 CID) R.P.O. all other engines.

CL2086-1F

BRAKE CONTROL VALVE USAGE CHART

Brake System		Car Line/s	Control Valve Assembly				Valve Fluid Port Dimensions			
			Type and Housing	Pressure Differential	Metering	Proportioning Split/Slope	Primary		Secondary	
Front	Rear						In	Out (2)	In	Out
Disc	Drum	Pinto (Sedan), Mustang II, Bobcat	2 Way Brass	X	–	300/.28	3/8	3/8	7/16	3/8
Disc	Drum	Pinto (Station Wagon), Bobcat	2 Way Brass	X	–	300/.43	3/8	3/8	7/16	7/16
Disc	Drum	LTD II, Thunderbird, Cougar	3 Way	X	X	400/.43	1/2	3/8	3/8	9/16
Disc	Drum	Ford/Mercury (Station Wagon), Police (Station Wagon) and Lincoln	Cast Iron			500/.58	7/16	3/8	3/8	9/16
Disc	Drum	Ford/Mercury, Police Sedan	3 Way Cast Iron	X	X	400/.58	1/2	3/8	7/16	9/16
Disc	Disc	Ford/Mercury Sedan, Lincoln and Mark V	2 Way Cast Iron	X	–	300/.43	1/2	3/8	7/16	5/8
Disc	Disc	Ford/Mercury (Station Wagon)	2 Way Cast Iron	X	–	500/.58	7/16	3/8	3/8	5/8
Disc	Disc	Granada/Monarch/Versailles	2 Way Brass	X	–	300/.43	3/8	3/8	3/8	3/8
Disc	Drum	Fairmont/Zephyr Sedan	2-Way Alum.	X		300/.43	3/8	3/8	7/16	7/16
Disc	Drum	Fairmont/Zephyr Sta. Wagon	2-Way Brass	X		400/.43	3/8	3/8	7/16	3/8

CH2307-2E

BRAKE CONTROL VALVE MOUNTING TORQUES

SIZE	FT-LB
5/16 – 18 Nut	7-11
1 5/16 – 18 J-Lock Bolt	12-20
1 When bolts are removed or turned in either direction after 30 minutes of installation, they must be replaced with new bolts.	

CH230B-2A

Drum Brakes — Single Cylinder, Dual Piston

**PART
12-02**
Applies To All Cars Except Lincoln Versailles and Continental Mark V

SUBJECT	PAGE	SUBJECT	PAGE
ADJUSTMENTS		REMOVAL AND INSTALLATION (Cont'd.)	
Brake Shoes	02-2	Brake Drums	02-3
DESCRIPTION		Brake Pedal	02-5
Dual Brake System	02-1	Brake Shoes	02-3
OVERHAUL		Dual Master Cylinder	02-5
Brake Drum Refinishing	02-5	Pressure Differential, Metering and Proportioning Valves	02-5
Brake Shoes	02-6	Wheel Cylinder	02-5
Wheel Cylinders	02-6	SPECIFICATIONS	02-7
REMOVAL AND INSTALLATION		SPECIAL TOOLS	02-7
Brake Backing Plate	02-5		

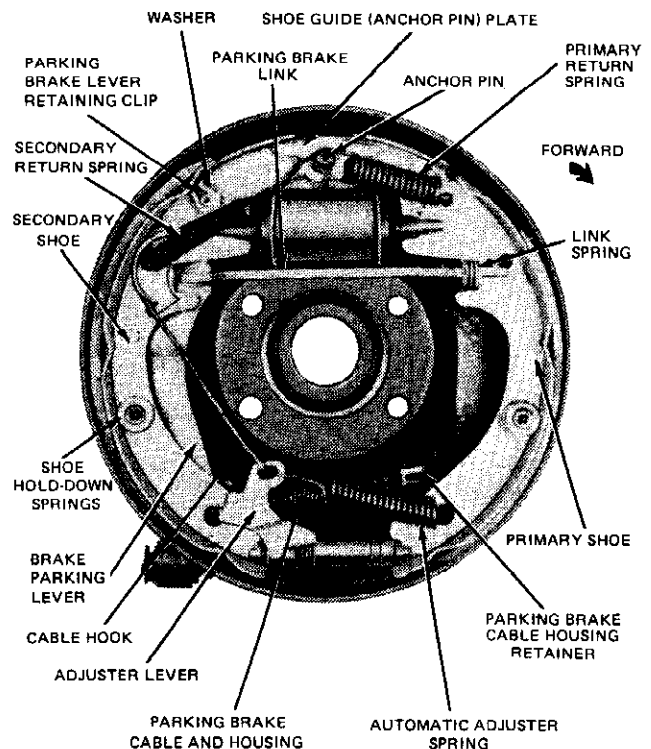
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DESCRIPTION

DUAL BRAKE SYSTEM

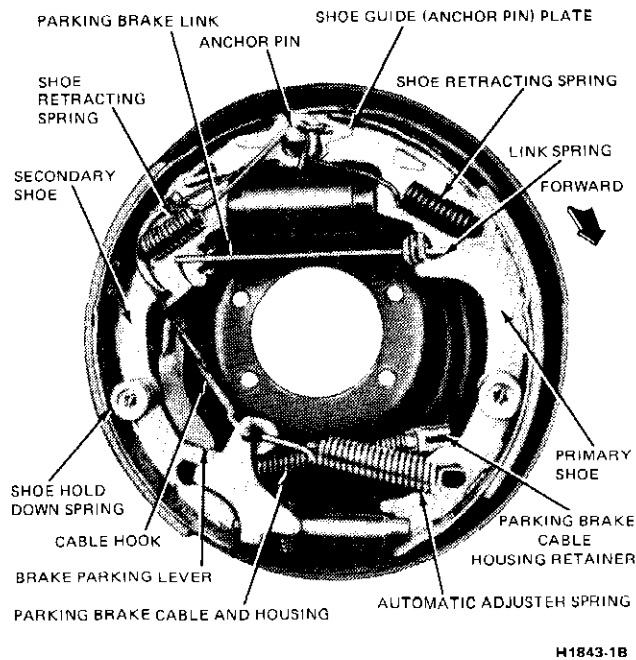
The rear wheel drum brake system employs single anchor, internal expanding, and self-adjusting brake assemblies.

The self-adjusting brake mechanism consists of a cable, cable guide, adjusting lever, adjusting screw assembly, and adjuster spring (Figs. 1 and 2). The cable is hooked over the anchor pin at the top, and is connected to the lever at the bottom. The cable is routed along the web of the secondary brake shoe by the cable guide. The adjuster spring is hooked to the primary brake shoe and to the lever. The automatic adjuster is actuated only when the brakes are applied while the vehicle is moving rearward, and only when the secondary shoe is free to move toward the drum beyond a predetermined point.



H1649-1E

**FIG. 1 Self-Adjusting Drum Brake Assemblies—
Typical**



**FIG. 2 Self-Adjusting Drum Brake Assembly
Pinto, Bobcat and Mustang**

ADJUSTMENTS

BRAKE SHOES

After any brake service work, obtain a firm brake pedal before moving the vehicle. Adjusted brakes must not drag; wheels must turn freely.

The hydraulic drum brakes are self-adjusting and require a manual adjustment only after the brake shoes have been relined, replaced, or when the length of the adjusting screw has been changed while performing some other service operation. The manual adjustment is performed with the drums removed, using the tool and the procedure detailed below.

When adjusting the rear brake shoes, check the parking brake cables for proper adjustment. Make sure that the equalizer operates freely with the shoes centered on the backing plate.

Make sure that the upper ends of the brake shoes are seated on the anchor pin. The parking brake link should have 0.005 to 0.025 inch end play after overcoming the load of the parking brake link anti-rattle spring.

To adjust the brake shoes:

1. Determine the inside diameter of the drum braking surface, using Rotunda Tool 11-0001 or equivalent (Fig. 3).
2. Adjust the brake shoe diameter to fit the gauge, as indicated in Fig. 3. Hold the automatic adjusting lever out of engagement while rotating the adjusting screw, to prevent burring the screw slots. Make sure the adjusting screw rotates freely. If necessary, lubricate the screw threads with a thin, uniform coating of lubricant C1AZ-19590-B or equivalent.

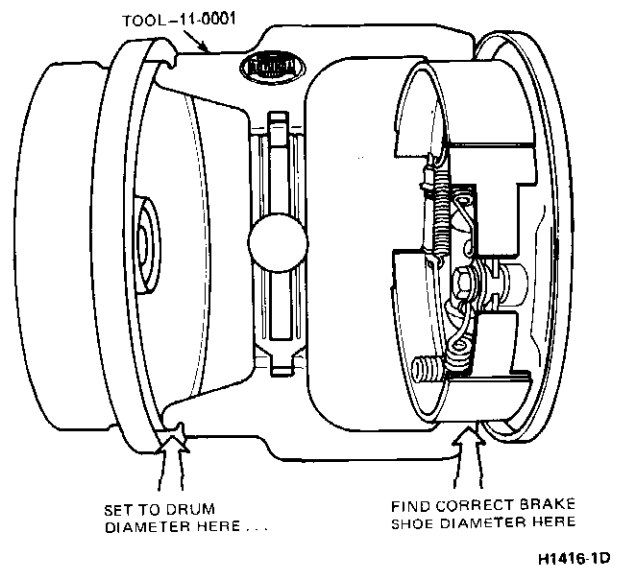


FIG. 3 Adjusting Brake Shoes Using Tool 11-0001

3. Rotate Tool 11-0001 or equivalent around the brake shoes to be sure of the setting.
4. Apply a small quantity of high temperature grease COAZ-19553-A or equivalent to the points where the shoes contact the backing plate,

being careful not to get the lubricant on the linings.

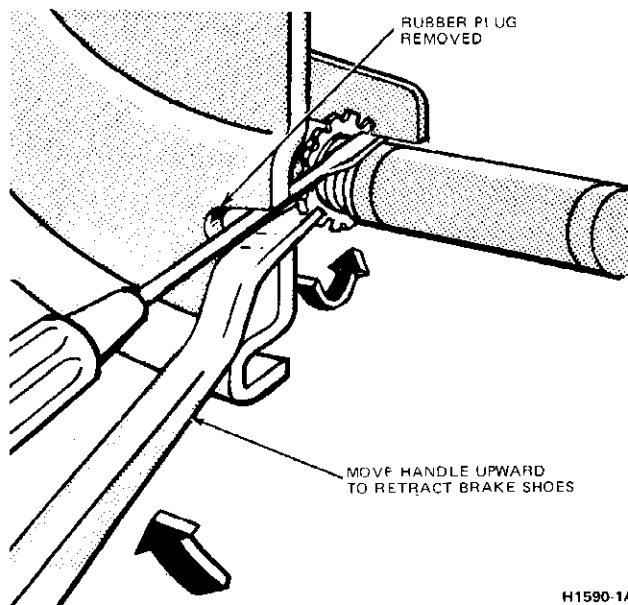
5. Install the drums. Install the drum retaining nuts and tighten securely.
6. Install the wheels on the drums and tighten the nuts to specification.
7. Complete the adjustment by applying the brakes several times with a minimum of 50 lbs. pressure

on the pedal (non-power brakes) or 25 lbs. pressure (power brakes) while backing the vehicle. After each stop, the vehicle must be moved forward.

8. After the brake shoes have been properly adjusted, check the operation of the brakes by making several stops from varying forward speeds.

REMOVAL AND INSTALLATION

BRAKE DRUMS



H1590-1A

FIG. 4 Backing Off Brake Adjustment

Removal—Rear

1. Raise the vehicle so that the tire is clear of the floor.
2. Remove the wheel cover and wheel.
3. Remove the three drum retainer nuts and remove the brake drum. If the drum will not come off, pry the rubber plug from the backing plate. Insert a narrow screwdriver through the hole in the backing plate, and disengage the adjusting lever from the adjusting screw (Fig. 4).

While holding the adjustment lever away from the screw, back off the adjusting screw with the brake adjusting tool (Fig. 4).

Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise the self-adjusting mechanism will not function properly.

Installation—Rear

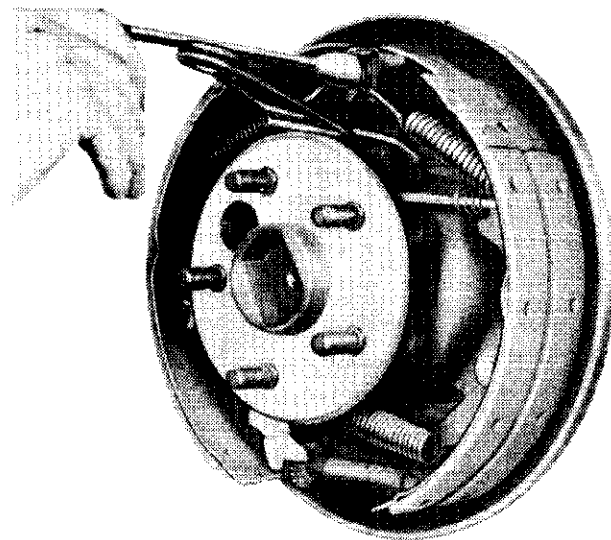
1. Remove the protective coating from a new drum with carburetor degreaser. Sand drum lightly and wipe with a cloth soaked with denatured alcohol.
2. Adjust the brakes as outlined under Brake Shoe Adjustments. Place the drum over the brake assembly and into position.

3. Install the three drum retainer nuts and tighten securely. Install the wheel on the axle shaft flange studs against the drum, and tighten the attaching nuts to specification. Install wheel cover.

BRAKE SHOES

Removal

1. With the wheel and drum removed, install a clamp over the ends of the brake cylinder as shown in Fig. 5.



H1390-1A

FIG. 5 Retracting Spring Removal

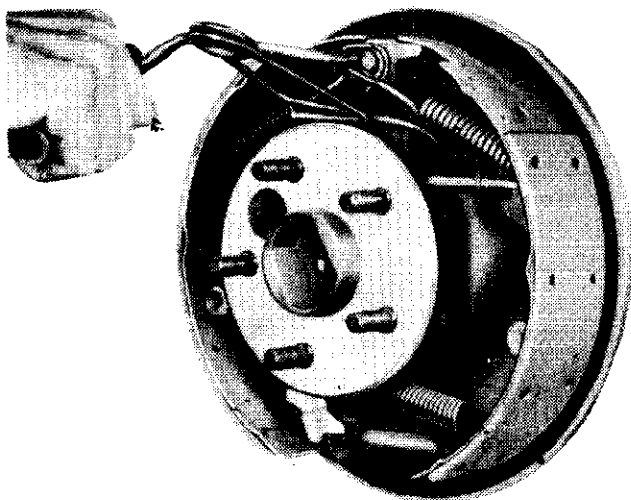
2. Remove the shoe-to-anchor springs, with the tool shown in Fig. 5, and unhook the cable eye from the anchor pin.
3. Remove the shoe guide (anchor pin) plate (Figs. 1 and 2).
4. Remove the shoe hold-down springs, shoes, adjusting screw, pivot nut, socket and automatic adjustment parts.
5. Remove the parking brake link, spring and retainer. Disconnect the parking brake cable from the parking brake lever.
6. After removing the rear brake secondary shoe, disassemble the parking brake lever from the shoe by removing the retaining clip and spring washer (Figs. 1 and 2).

Installation

1. Before installing the rear brake shoes, assemble the parking brake lever to the secondary shoe and secure with the spring washer and retaining clip

(Figs. 1 and 2). A tang on the parking brake lever engages the secondary shoe on 9-inch brakes.

2. Apply a light coating of high temperature grease COAZ-19553-A or equivalent at the points where the brake shoes contact the backing plate.
3. Position the brake shoes on the backing plate. The primary shoe with the short lining faces toward the front of the car. The secondary shoe (long lining) faces rearward. Secure the assembly with the hold down springs. Install the parking brake link, spring and retainer. Back off the parking brake adjustment; then, connect the parking brake cable to the parking brake lever (Figs. 1 and 2).
4. Install the shoe guide (anchor pin) plate on the anchor pin.
5. Place the cable eye over the anchor pin with the crimped side toward the drum.
6. Install the primary shoe to anchor spring. See Fig. 6.

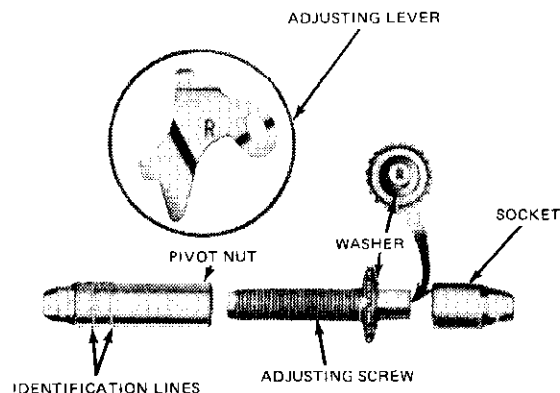


H1391-18

FIG. 6 Retracting Spring Installation

7. Install the cable guide on the secondary shoe web with the flanged hole fitted into the hole in the secondary shoe web. Thread the cable around the cable guide groove (Figs. 1 and 2). **It is imperative that the cable be positioned in this groove and not between the guide and the shoe web.**
8. Install the secondary shoe-to-anchor spring with the tool shown in Fig. 6. **Be certain that the cable eye is not cocked or binding on the anchor pin when installed. All parts should be flat on the anchor pin.**
9. Remove the brake cylinder clamp after both shoe-to-anchor springs have been installed.
10. Apply a thin, uniform coat of lubricant (C1AZ-19590-B or equivalent) to the threads and the socket end of the adjusting screw. Turn the adjusting screw into the adjusting pivot nut (Figs. 1 and 2) to the limit of the threads and then back off 1/2 turn. **Interchanging the brake shoe adjusting screw assemblies from one side of**

the vehicle to the other would cause the brake shoes to retract rather than expand each time the automatic adjusting mechanism operated. To prevent installation on the wrong side of the vehicle, the socket end of the adjusting screw is stamped with an R or L (Fig. 7).



H1143-1B

FIG. 7 Adjusting Screw and Lever Identification

11. Place the adjusting socket on the screw and install this assembly between the shoe ends with the adjusting screw toothed wheel nearest the secondary shoe.
12. Hook the cable hook into the hole in the adjusting lever. The adjusting levers are stamped with an R or L to indicate their installation on right or left brake assembly (Fig. 7).
13. Position the hooked end of the adjuster spring completely into the large hole in the primary shoe web. Connect the loop end of the spring to the adjuster lever hole.
14. Pull the adjuster lever, cable and automatic adjuster spring down and toward the rear to engage the pivot hook in the large hole in the secondary shoe web (Figs. 1 and 2).
15. After installation, check the action of the adjuster by pulling the cable between the cable guide and the adjuster lever, toward the secondary shoe web, far enough to lift the lever past a tooth on the adjusting screw wheel. The lever should snap into position behind the next tooth, and release of the cable should cause the adjuster spring to return the lever to its original position. This return action of the lever will turn the adjusting screw one tooth.

If pulling the cable does not produce the action described, or if the lever action is sluggish instead of positive and sharp, check the position of the lever on the adjusting screw toothed wheel (Fig. 4).

With the brake in a vertical position (anchor at the top), the lever should contact the adjusting wheel 3/16 inch (plus or minus 1/32 inch) above the centerline of the screw. If the contact point is below this centerline, the lever will not lock on the teeth in the adjusting screw wheel, and the screw will not be turned.

To determine the cause of this condition:

- a. Check to be sure that the upper or anchor pin end of the cable is pulled toward the shoe guide as far

- as possible and that the end fitting is pointing toward the shoe guide.
- Check the cable end fittings. The cable should completely fill or extend slightly beyond the crimped section of the fittings. If it does not meet this specification, possible damage is indicated and the cable assembly should be replaced.
 - Check the cable length. Measure from the inside edge of the hook to the far edge of the anchor hole. The cable length for 11-inch brakes is 11-1/8 inches. For 10-inch brakes it is 9-3/4 inches. For 9-inch brakes, the length is 8-7/16 inches. The tolerance on cable length is plus or minus 1/64 inch.
 - Check the cable guide for damage. The cable groove should be parallel to the shoe web, and the body of the guide should lie flat against the web. Replace the guide if it shows damage.
 - Check the pivot hook on the lever. The hook surfaces should be square with the body of the lever for proper pivoting. Replace the lever if the hook shows damage.
 - See that the adjusting screw socket is properly seated in the notch in the shoe web.
16. Be sure that the upper ends of the brake shoes are seated against the anchor pin and that the shoes are centered on the backing plate. If they are not seated, back off the parking brake system adjustment to obtain 0.005-0.025 inch play after overcoming the load of the parking brake link spring.

WHEEL CYLINDER

Removal

- Remove the wheel and the drum.
- Remove the brake shoe assemblies, following procedures outlined in this Part.
- Disconnect the brake tube from the brake cylinder at the backing plate. The tube will separate from the cylinder when the cylinder is removed from the backing plate.
- Remove the wheel cylinder attaching bolts and lock washers and remove the cylinder.

Installation

- Wipe the end(s) of the hydraulic line to remove any foreign matter before making connections.
- Position the cylinder on the backing plate and finger tighten the brake tube to the cylinder.
 - Secure the cylinder to the backing plate by installing the attaching bolts and lock washers. Torque bolts to specification.

- Tighten the tube fitting nut to specification with Tool 1112-144 (Tube Nut Wrench).
- Install the links (10 and 11-inch brakes) in the ends of the wheel cylinder and install the shoes and adjuster assemblies.
- Adjust the brakes as described in this Part. Install the brake drum and wheel. Bleed the brakes.

BRAKE BACKING PLATE

Removal

- Remove the wheel and brake drum. Disconnect the brake line from the brake cylinder.
- Remove the brake shoes adjuster assemblies and the wheel cylinder as outlined in this section.
- Refer to Group 15 for procedure and remove the axle shaft.
- Remove the backing plate.

Installation

- The rear backing plate is mounted on the axle housing flange with four bolts. Torque to specification.
- Refer to Group 15 for procedure and install the rear axle shaft, seal, if required, and the new backing plate.
- Install the wheel cylinder and connect the brake line as indicated in preceding Steps.
- Install the brake shoes adjuster assemblies as outlined in this Part. Connect the parking brake cable to the lever.
- Adjust the brake shoes as outlined, and install the brake drums and wheels. Bleed the brake system and centralize the differential valve as outlined in Part 12-01.

DUAL MASTER CYLINDER

Refer to Part 12-01 for Removal and Installation of Dual Master Cylinder.

PRESSURE DIFFERENTIAL, METERING, AND PROPORTIONING VALVES

Refer to Part 12-01 for Description, Removal and Installation of Pressure Differential, Metering, and Proportioning Valves.

BRAKE PEDAL

Refer to Part 12-01 for Removal and Installation of Brake Pedal.

OVERHAUL

BRAKE DRUM REFINISHING

Minor scores on a brake drum can be removed with sandpaper. Do not refinish drums to remove score marks. A drum surface which is highly polished can cause the brake to lock-up. This polished condition should be removed either with sandpaper or by

refinishing the drum. A drum that is out of round sufficient to cause vehicle vibration when braking should be refinished. Remove only enough stock to true up the drum. Brake drum maximum inside diameter is shown on each drum (Part 12-01). If the maximum inside

diameter shown on the drum is exceeded either through wear or refinishing, the drum must be replaced.

Check the inside diameter of the brake drum with a brake drum micrometer (Tool 10-0010).

After a drum is refinished, wipe the refinished surface with a cloth soaked in clean denatured alcohol. If one drum is refinished, the opposite drum on the same axle should also be refinished to the same diameter.

BRAKE SHOES

Relining

Brake linings that are worn to within 1/32 inch of a rivet head or have been contaminated with brake fluid, grease or oil must be replaced. Failure to replace worn linings will result in a scored drum. **When it is necessary to replace linings, they must also be replaced on the wheel on the opposite side of the vehicle. Inspect brake shoes for distortion, cracks, or looseness. If this condition exists, the shoe must be discarded. Do not attempt to repair a damaged brake shoe.**

1. Wash the brake shoes thoroughly in a clean solvent. Dry thoroughly. Remove all burrs or rough spots from the shoes.
2. Check the inside diameter of the brake drum with a brake drum micrometer (Tool 10-0010).
3. Position the new lining on the shoe. Starting in the center, insert and secure the rivets, working alternately towards each end. **Replacement linings are ground and no further grinding is required.**
4. Check the clearance between the shoe and lining. The lining must seat tightly against the shoe with not more than 0.008 inch clearance between any two rivets.

WHEEL CYLINDERS

Wheel cylinders should not be disassembled unless they are leaking. Carefully pull lower edges of wheel cylinder boots away from cylinders and note whether

interior is wet with brake fluid. Excessive fluid at this point indicates leakage past piston cups and a need for wheel cylinder overhaul. **NOTE: A slight amount of fluid is nearly always present and acts as a lubricant for the piston.** It is not necessary to remove the brake cylinder from the backing plate to disassemble, inspect, or hone and overhaul the cylinder. Removal is necessary only if the cylinder is damaged or scored beyond repair.

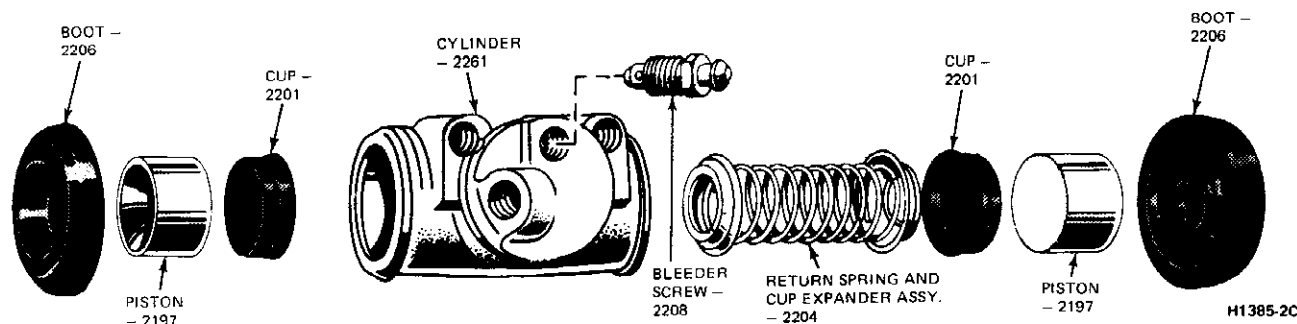
Disassembly

1. Remove the links (10 and 11-inch brakes) and the rubber boots from the ends of the brake cylinder. Remove the pistons, cups, and return spring and expander assembly from the cylinder bore (Fig. 8).
2. Remove the bleeder screw from the cylinder.
3. Discard all rubber parts and wash all other parts in clean denatured alcohol.
4. Inspect piston for scratches, scoring or other visible damage. Replace if necessary. Always replace the rubber cups and dust boots.
5. Inspect the cylinder bore for score marks or rust. If either condition is present, the cylinder bore must be honed. **However, the cylinder should not be honed more than 0.003 inch beyond its original diameter.**
6. Wash the cylinder with clean denatured alcohol after honing and dry it with compressed air.
7. Check the bleeder hole to be sure that it is open.

Assembly

Use all parts in the wheel cylinder repair kit.

1. Apply a light coating of heavy duty brake fluid to all internal parts.
2. Thread the bleeder screw into the cylinder and tighten securely.
3. Insert the return spring and expander assembly, cups, and pistons into their respective positions in the cylinder bore (Fig. 8). Place a boot over each end of the cylinder.



H1385-2C

FIG. 8 Brake Wheel Cylinder—Typical

SPECIFICATIONS AND SPECIAL TOOLS

DRUM BRAKE LINING DIMENSIONS (INCHES)

FORD-MERCURY

MODELS	POSITION	COLOR CODE	BRAKE SIZE	LINING SIZE	
				FRONT	REAR
All Ford, Mercury, Station Wagons and Sedans (includes Police)	Primary	Black-Black	11	N/A	2.50 x 9.38
	Secondary	Blue-Blue	11	N/A	2.50 x 12.12
LTD II, COUGAR AND THUNDERBIRD					
All Sedans and Rancheros	Primary	Black-Black	11	N/A	2.25 x 9.38
	Secondary	Blue-Blue	11	N/A	2.25 x 12.12
Taxi and Police-Sedans	Primary	Black-Black	11	N/A	2.50 x 9.38
	Secondary	Blue-Blue	11	N/A	2.50 x 12.12
PINTO-MUSTANG-BOBCAT					
All Models	Primary	Black-Black	9	N/A	1.75 x 6.12
	Secondary	Blue-Blue	9	N/A	1.75 x 8.63
FAIRMOUNT-ZEPHYR					
Fairmont/Zephyr - Sedans	Primary	Red	9	N/A	1.75 x 6.12
	Secondary	White	9	N/A	1.75 x 8.63
Fairmont/Zephyr Station Wagons	Primary	Black-Black	10	N/A	1.75 x 8.55
	Secondary	Blue-Blue	10	N/A	1.75 x 10.45
GRANADA-MONARCH					
All Models	Primary	Black-Black	10	N/A	2.00 x 8.55
	Secondary	Blue-Blue	10	N/A	2.00 x 10.45
LINCOLN CONTINENTAL					
All Models	Primary	Black-Black	11	N/A	2.50 x 9.38
	Secondary	Blue-Blue	11	N/A	2.50 x 12.12
THUNDERBIRD					
All Models	Primary	Black-Black	11	N/A	2.50 x 9.38
	Secondary	Blue-Blue	11	N/A	2.50 x 12.12

CH2054-2J

BORE DIAMETERS — BRAKE DRUM, WHEEL CYLINDER AND MASTER CYLINDER

Car Line	Models	Brake Drum		Wheel Cylinder Bore Diameter		Master Cylinder Bore Diameter	
		Inside Diameter	Boring Limit (Max.) ①	Front ②	Rear ②	With Power Brake	Less Power Brake
Ford, Mercury	All	11.030	11.090	N/A	1.000	1.000	—
LTD II, Thunderbird, and Cougar	Sedan exc. Police and Taxi	11.030	11.090	N/A	0.9375	1.000	1.000
LTD II, Cougar	Police and Taxi	11.030	11.090	N/A	1.000	1.000	1.000
Pinto, Bobcat, Mustang	All	9.000	9.060	N/A	0.875	0.938	0.938
Fairmont, Zephyr	Sedans	9.000	9.060	N/A	0.8125	0.875	0.875
	Station Wagons	10.000	10.060	N/A	0.8125	0.875	0.875
Granada, Monarch	All	10.000	10.060	N/A	0.9375	0.938	0.938
Lincoln Continental	All	11.030	11.090	N/A	1.000	1.000	—

① Max. Runout 0.007 ② Max. Allowable Hone 0.003

CH1864-2L

DRUM BRAKE TORQUE LIMITS — FT-LBS

	Ford, Mercury	LTD II, Cougar, Granada, Monarch	Fairmont, Zephyr		Mustang, Bobcat, Pinto	Thunderbird	Lincoln Continental
			Sedan	Sta. Wgn.			
Wheel Cylinder to Backing Plate Screws	10-20	10-20	110-160 (In-Lbs)	10-20	110-160 (In-Lbs)	10-20	10-20
Rear Brake Backing Plate to Axle Housing Removable Carrier Integral Type	50-75	20-40	—	—	20-40	20-40	50-75
	20-40	20-40	20-40	20-40	20-40	20-40	
Wheel Cylinder Bleeder Screw	7.5-15	7.5-15	32-65 (In-Lbs)	7.5-15	32-65 (In-Lbs)	7.5-15	7.5-15
Wheel to Hub and Drum	70-115	70-115	70-115	70-115	70-115	70-115	70-115

SERVICE TOOLS

Tool No.	Description	Tool No.	Description
Rotunda 11-0001	Brake Adjusting Gage	Tool 7000-DE	Rubber Tipped Air Nozzle
BL-41-A (Snap-on)	Brake Cylinder Retaining Clamp	Tool 33621	Internal Snap Ring Pliers
B3404-B (Snap-on)	Brake Adjusting Tool	Milbar 1112-144	Tube Nut Wrench
2162	Adapter Cap		Inch Pound Torque Wrench
BT-11 (Snap-on)	Brake Shoe R & R Spring	Rotunda 10-0010	Axle Shaft Remover Brake Drum Micrometer

CH1865-2H

Disc Brakes—Single Piston— Sliding Caliper

**PART
12-20**

Applies to All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION		REMOVAL AND INSTALLATION (Cont'd.)	
All Cars Except Fairmont/Zephyr	20-1	Disc Brake Caliper Assembly — Front	20-4
Fairmont/Zephyr Front Disc Brake	20-2	Disc Brake Caliper Assembly — Rear	20-12
Rear Disc Brakes	20-4	Disc Brake Rotor Splash Shield — Front	20-12
Rotor — Front	20-1	Disc Brake Rotor Splash Shield — Rear	20-16
Rotor — Rear	20-4	Disc Brake Shoe and Lining — Front	20-8
Sliding Caliper Assembly — Front	20-1	Disc Brake Shoe and Lining — Rear	20-16
OVERHAUL		Dual Master Cylinder — Refer to Part 12-01	
Disc Brake Caliper — Front	20-17	Hub and Rotor — Front	20-9
Disc Brake Caliper — Rear	20-17	Pressure Differential, Metering, and Proportioning Valves — Refer to Part 12-01	
Rotor Refinishing	20-20	Rotor — Rear	20-16
REMOVAL AND INSTALLATION		SPECIFICATIONS AND SPECIAL TOOLS	20-22
Anchor Plate — Front	20-12		
Anchor Plate — Rear	20-16		
Brake Booster — Vacuum — Refer to Part 12-50			
Brake Booster — Hydraulic — Refer to Part 12-51			

CH2557-2B

DESCRIPTION

ALL CARS EXCEPT FAIRMONT/ZEPHYR

Front disc brakes are standard on all models. Drum brakes are used on the rear wheels of most models.

Rear disc brakes are standard on Continental Mark V and Versailles, optional on Lincoln Continental, Ford, Mercury, Granada and Monarch.

The disc brake consists of a ventilated rotor and sliding caliper assembly (Fig. 1).

SLIDING CALIPER ASSEMBLY FRONT

The caliper assembly is made up of a sliding caliper housing assembly and an anchor plate (Fig. 2).

The anchor plate is bolted to the wheel spindle by two bolts. Two angular machined surfaces on the upper end of the caliper housing contact the mating machine surfaces of the anchor plate. A plated steel key and a caliper support spring are fitted between the angular machined surfaces of the lower end of the caliper and the machined surface of the anchor plate. The caliper is held in position against the mating surfaces of the anchor plate by means of the caliper support spring. A brake shoe anti-rattle spring clip is provided on the lower end of the inner brake shoe and lining assembly.

The brake linings are riveted to the brake shoes and insulator gaskets are bonded to the back of each brake shoe. The inner and outer brake shoe and lining assemblies are not interchangeable.

NOTE: Brake friction materials inherently generate noise and heat in order to dissipate energy. As a result, occasional squeal is normal, and is aggravated by severe environmental conditions such as cold, hot, wet, snow, salt, mud, etc.

The sliding caliper contains a single cylinder and a piston with a molded rubber dust boot to seal the cylinder bore from contamination. A square section rubber piston seal is positioned in a groove in the cylinder bore to provide sealing between the cylinder and the piston.

ROTOR—FRONT

The cast iron disc is of the ventilated rotor-type, incorporating non-directional cooling fins, and is integral with the wheel hub. A splash shield bolted to the spindle is used to prevent road contaminants from contacting the inboard rotor surface and to direct cool

air to the brakes. The wheel provides protection for the outboard surface of the rotor.

FAIRMONT AND ZEPHYR FRONT DISC BRAKE (SEE FIG. 3)

CALIPER ASSEMBLY

The caliper assembly consists of a pin slider caliper housing, inner and outer shoe and lining assemblies and a single piston. The caliper assembly slides on two locating pins which also act as the attaching bolts between the caliper and the combination anchor plate and spindle.

The caliper housing contains a single piston similar to those used on existing disc brake calipers. The piston has a molded rubber dust boot on its outer end that attaches to a cylinder bore groove for prevention of contamination in the cylinder. There is also a rectangular section rubber piston seal located in the cylinder bore to provide sealing between the cylinder and piston (See Fig. 3).

The outer brake shoe and lining assembly is longer than the inner shoe and lining assembly. Both inner and outer shoe lining assemblies are attached to the caliper by spring clips riveted to the shoe surfaces. The inner shoe is attached to the caliper by installing the spring clip to the inside of the caliper piston. The outer shoe clips directly to the caliper housing (See Fig. 11). A metal wear indicator is attached to the outer shoe and lining assembly. This indicator emits a noise when the lining is worn to a point where replacement is necessary. The inner and outer shoes are right and left hand and

must not be interchanged. Two rubber insulators with plastic inner sleeves are installed in the caliper attaching holes. The insulators and sleeves prevent metal-to-metal contact between the locating pins and the caliper.

ANCHOR PLATE

The anchor plate design for Fairmont/Zephyr vehicles is an all new design in that it is an integral part of the spindle. This combination spindle and anchor plate bolts to the modified MacPherson strut. The

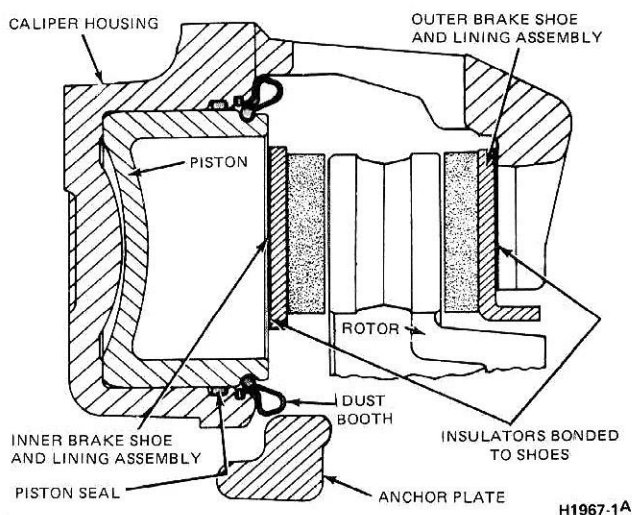


FIG. 2 Sliding Caliper Assembly Sectional View Front—All Models except Fairmont/Zephyr

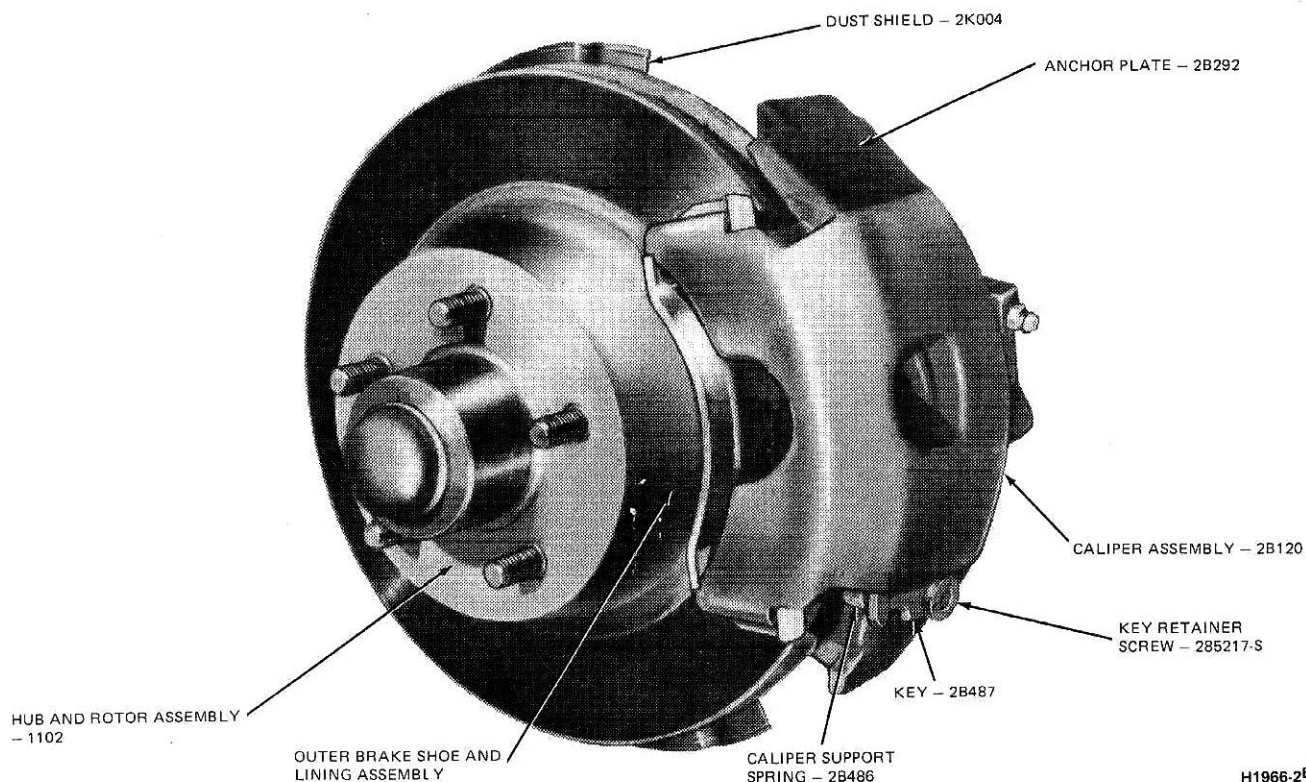
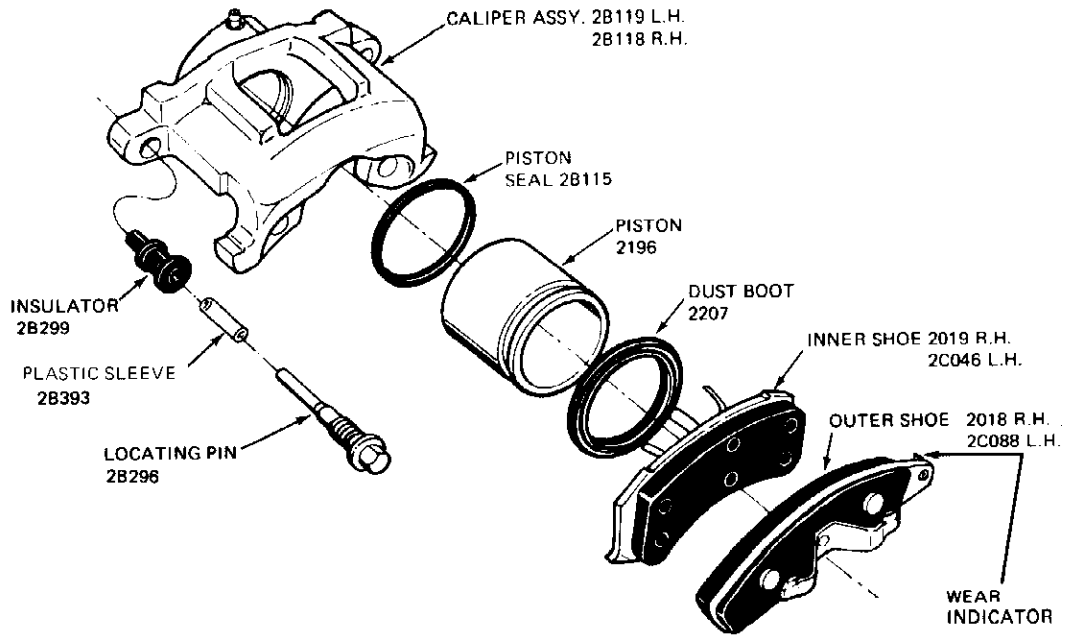


FIG. 1 Disc Brake Assembly—Front—Except Fairmont/Zephyr



**PIN SLIDER CALIPER ASSEMBLY – DISASSEMBLED
R.H. SIDE SHOWN**

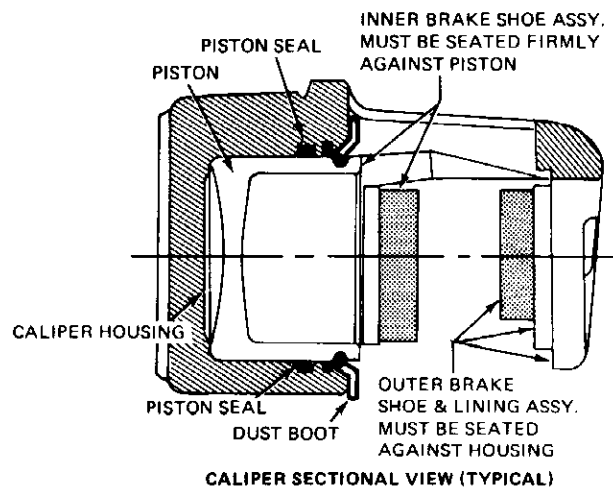
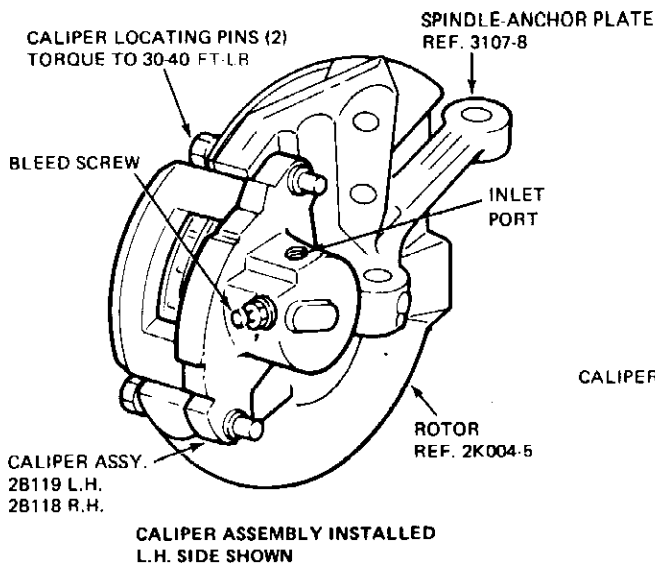


FIG. 3 Component Parts—Pin Slider Caliper—Fairmont/Zephyr

spindles are right or left hand and not interchangeable (see Fig. 12).

ROTOR AND SPLASH SHIELD

The rotor is a cast iron disc design, similar to existing designs, which attaches to the combination spindle/anchor plate in the same manner as existing front disc rotors. The splash shield is new, but retains the design similarities of existing shields. Attachment of the shield to the spindle is accomplished using three bolts as on current installations.

REAR DISC BRAKES

A hydraulically-powered brake booster provides the power assist for the four-wheel disc brake system.

A dual master cylinder attaches to, and is actuated by, the hydraulic booster. A two-way pressure control valve provides balanced braking action between the front and rear brakes.

Except for the parking brake mechanism, the rear caliper assembly is basically similar to the large size front brake caliper in present use. The added parking brake lever on the back of the caliper is cable-operated by the parking brake pedal located below the instrument panel, similar to rear drum brake installations. The parking brake is self-adjusting.

The component parts of the housing assembly are shown in Fig. 4. A square section rubber seal in the cylinder bore groove provides sealing between the housing and the piston. A rubber O-ring seal is positioned in a groove in the thrust screw bore in the housing. A molded lip seal is pressed into the outboard side of the end retainer to prevent entry of water and contaminants between the operating shaft and end retainer. A rubber O-ring on the end retainer prevents entry of water into the caliper through the end retainer threads. The components in the parking brake mechanism cavity in the back of the caliper housing are lubricated with silicone grease.

The parking brake lever is secured to the operating shaft by a nylon-patched screw. When the parking brake is applied, the cable rotates the lever and operating shaft. The three (3) steel balls, located in pockets on the opposing heads of the operating shaft and thrust screw, roll between ramps formed in these ball pockets. The balls force the thrust screw away from the operating shaft, driving the piston and shoe-lining assembly against the rotor and thus creating the braking force.

An automatic adjuster in the piston moves on the thrust screw to compensate for lining wear and maintain proper clearance in the parking brake mechanism.

The caliper is similar in design and function on all car lines, except that the piston and cylinder on the Granada/Monarch/Versailles calipers are smaller than in the large cars. Also, the location of the hose inlet and bleeder ports differ as shown in Fig. 4. On Lincoln Continental, Ford and Mercury, the hose fitting screws into the caliper and points forward, directly over the axle tube. On Continental Mark V vehicles, the hose fitting points almost directly upward and is attached to the caliper by a hollow bolt. On Granada/Monarch/Versailles, the fitting is attached by a hollow bolt and is located by a pin on the fitting which engages a hole in the caliper.

ROTOR—REAR

The rear disc brake rotors (Fig. 5) are cast iron units of ventilated design. Ventilation is provided by curved fins between the braking surfaces, which cause the rotor to act as an air pump. As the rotor fins are designed to take advantage of the forward motion of the vehicle, they are not interchangeable. They are identified by RIGHT or LEFT cast inside the hat section of the rotor.

The rotor attaches to the rear axle flange in the same manner as a rear brake drum. A splash shield (Fig. 6) bolted to the forged axle adapter protects the rotor inboard surface from road splash and contaminants. The wheel protects the outboard surface of the rotor.

REMOVAL AND INSTALLATION

DISC BRAKE CALIPER ASSEMBLY—FRONT—ALL EXCEPT FAIRMONT/ZEPHYR

After any service work, obtain a firm brake pedal before moving the vehicle. Riding the brake pedal (common on left-foot application) must be avoided when driving the vehicle.

Removal

1. Raise the car and install safety stands under the car. Block both rear wheels if a jack is used.
2. Remove the wheel and tire assembly from the hub.
3. Disconnect the flexible brake hose from the caliper. To disconnect the hose, loosen the tube fitting which connects it to the brake tube at its bracket on the frame. Remove the horseshoe-type retaining clip from the hose and bracket, disengage the hose from the bracket; then unscrew the entire hose assembly from the caliper.

4. Remove the retaining screw from the caliper retaining key (Fig. 7-1).
5. Drive the caliper retaining key and support spring either inward or outward from the anchor plate. Use a hammer and drift, if necessary, to remove the key and caliper support spring. Use care to avoid damaging the key and spring (Fig. 7-2 and 7-3).
6. Lift the caliper assembly away from the anchor plate by pushing the caliper downward against the anchor plate, and working the upper end upward and out of the anchor plate (Fig. 7-4).
7. Remove the inner shoe and lining assembly from the anchor plate. The brake shoe anti-rattle clip (inner shoe only) may become displaced at this time and, if so, reposition it on the inner shoe. Tap lightly on the outer shoe and lining assembly to free it from the caliper.
8. Clean the caliper, anchor plate and rotor assemblies and inspect them for signs of brake fluid

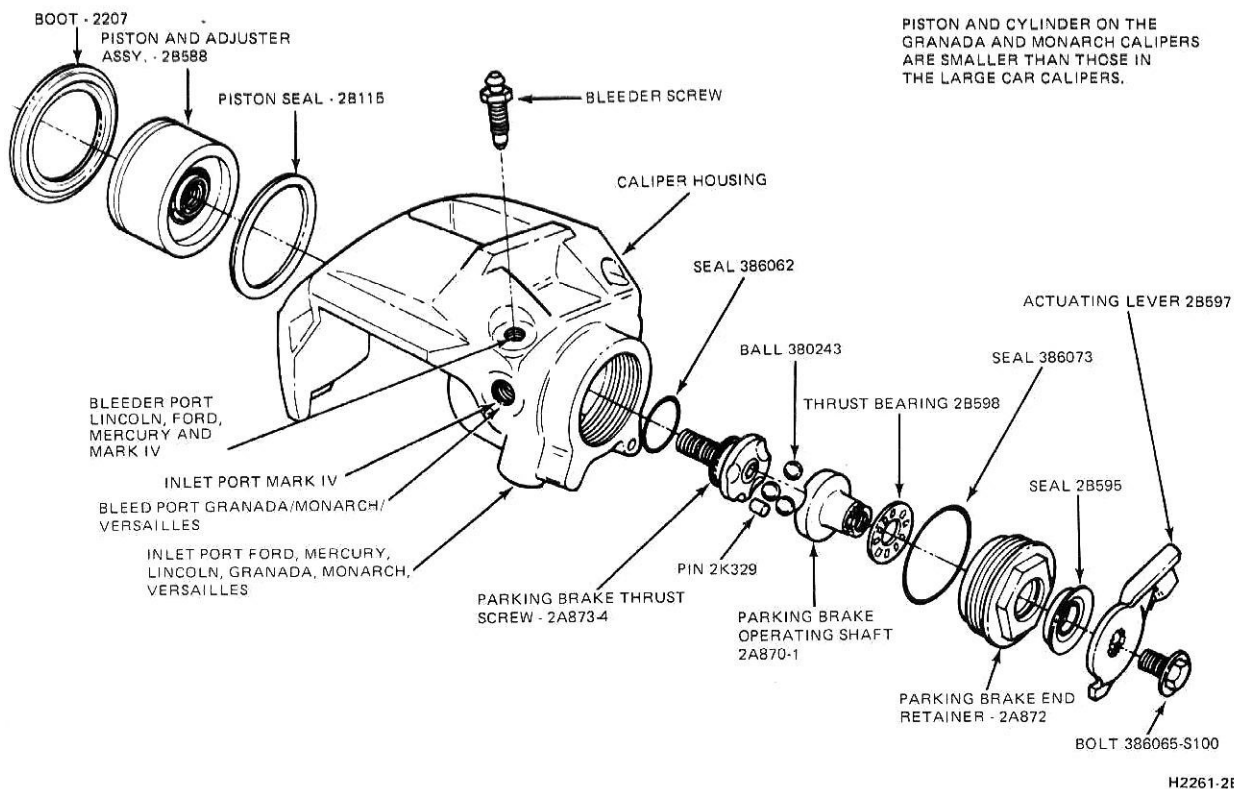


FIG. 4 Rear Disc Brake Housing Assembly

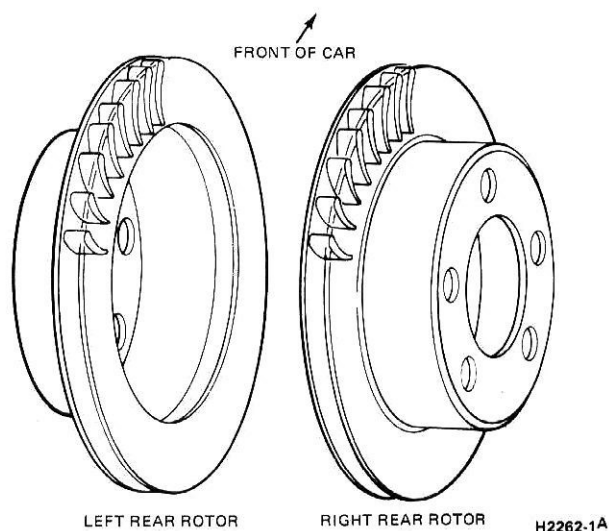


FIG. 5 Rear Disc Brake Rotor Identification

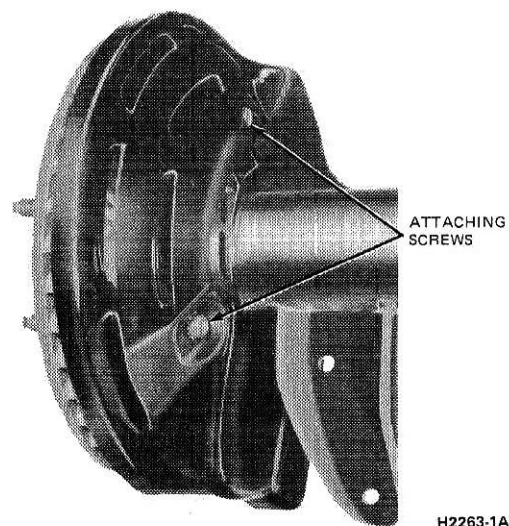


FIG. 6 Rear Disc Brake Rotor Splash Shield—Typical